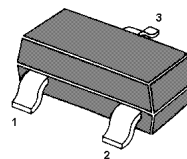
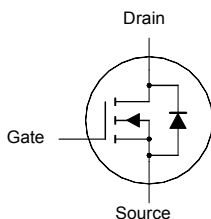


## 2N7002 N-Channel Enhancement Mode Field Effect Transistor

### Features

- High density cell design for low  $R_{DS(ON)}$
- Voltage controlled small signal switching
- High saturation current capability
- High speed switching



1.Gate 2.Source 3.Drain  
SOT-23 Plastic Package

### Absolute Maximum Ratings ( $T_a = 25\text{ }^\circ\text{C}$ )

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSS}$	60	V
Drain-Gate Voltage ( $R_{GS} \leq 1M\Omega$ )	$V_{DGR}$	60	V
Gate-Source Voltage -Continuous -Non Repetitive ( $t_p < 50\ \mu s$ )	$V_{GSS}$	$\pm 20$ $\pm 40$	V
Maximum Drain Current -Continuous -Pulsed	$I_D$	115 800	mA
Total Power Dissipation	$P_{tot}$	200	mW
Operating and Storage Temperature Range	$T_J, T_s$	- 55 to + 150	$^\circ\text{C}$

### Characteristics at $T_a = 25\text{ }^\circ\text{C}$

Parameter	Symbol	Min.	Max.	Unit
Drain Source Breakdown Voltage at $I_D = 10\ \mu A$	$BV_{DSS}$	60	-	V
Zero Gate Voltage Drain Current at $V_{DS} = 60\text{ V}$	$I_{DSS}$	-	1	$\mu A$
Gate-Body Leakage Current at $V_{GS} = \pm 20\text{ V}$	$\pm I_{GSS}$	-	100	nA
Gate Threshold Voltage at $V_{DS} = V_{GS}, I_D = 250\ \mu A$	$V_{GS(th)}$	1	2.5	V
On-State Drain Current at $V_{GS} = 10\text{ V}, V_{DS} = 7.5\text{ V}$	$I_{D(ON)}$	500	-	mA
Drain-Source On-Voltage at $V_{GS} = 10\text{ V}, I_D = 500\text{ mA}$ at $V_{GS} = 5\text{ V}, I_D = 50\text{ mA}$	$V_{DS(ON)}$	- -	3.75 1.5	V V
Static Drain-Source On-Resistance at $V_{GS} = 10\text{ V}, I_D = 500\text{ mA}$	$R_{DS(ON)}$	-	7.5	$\Omega$
Forward Transconductance at $V_{DS} = 10\text{ V}, I_D = 200\text{ mA}$	$g_{FS}$	80	-	mS
Input Capacitance at $V_{DS} = 25\text{ V}, f = 1\text{ MHz}$	$C_{iss}$	-	50	pF
Output Capacitance at $V_{DS} = 25\text{ V}, f = 1\text{ MHz}$	$C_{oss}$	-	25	pF
Reverse Transfer Capacitance at $V_{DS} = 25\text{ V}, f = 1\text{ MHz}$	$C_{rss}$	-	5	pF
Turn-On Time at $V_{DD} = 30\text{ V}, R_L = 150\ \Omega, I_D = 0.2\text{ A}, V_{GS} = 10\text{ V}, R_{GEN} = 25\Omega$	$t_{on}$	-	20	ns
Turn-Off Time at $V_{DD} = 30\text{ V}, R_L = 150\ \Omega, I_D = 0.2\text{ A}, V_{GS} = 10\text{ V}, R_{GEN} = 25\Omega$	$t_{off}$	-	20	ns

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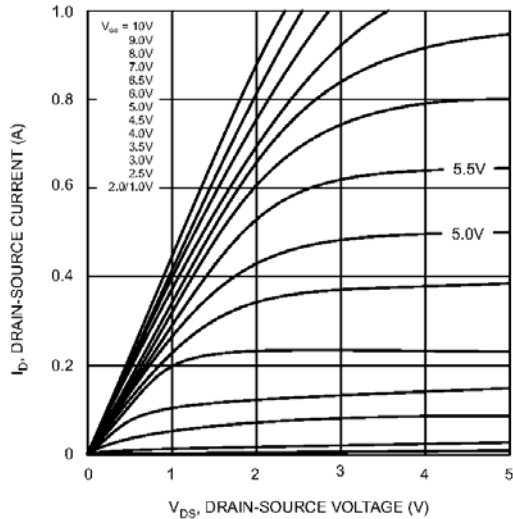


Fig. 1 On-Region Characteristics

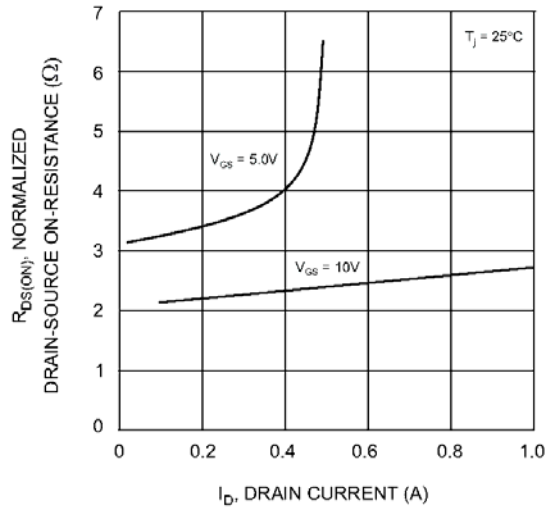


Fig. 2 On-Resistance vs Drain Current

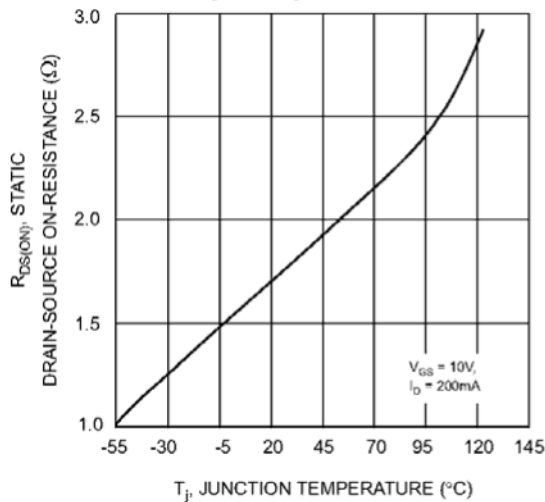


Fig. 3 On-Resistance vs Junction Temperature

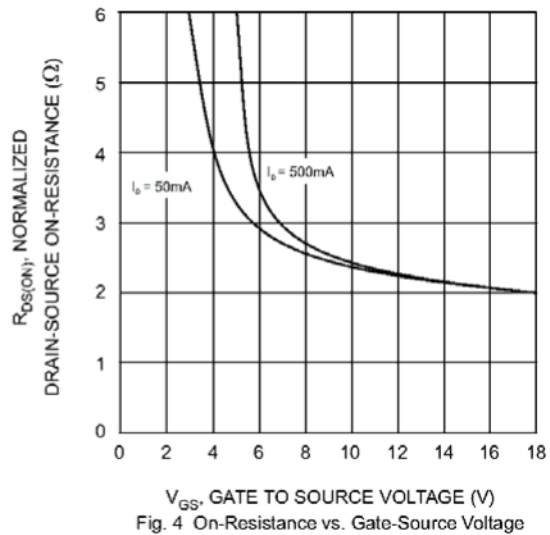


Fig. 4 On-Resistance vs. Gate-Source Voltage

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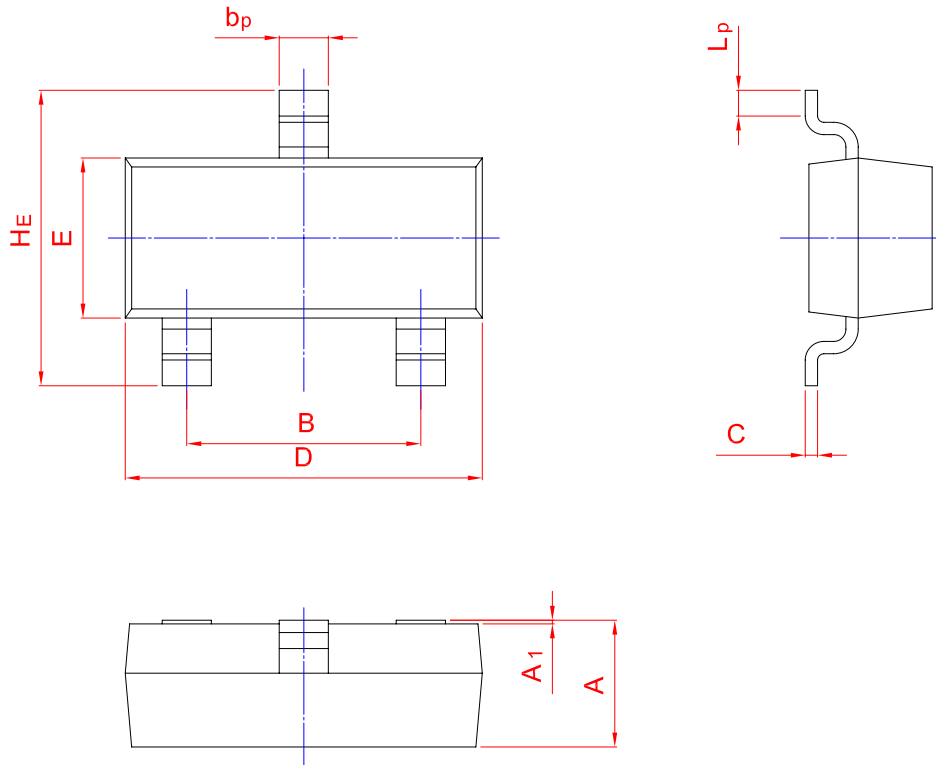
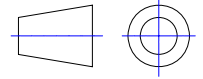
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## PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT-23



UNIT	A	B	bp	C	D	E	H	A <sub>1</sub>	L <sub>p</sub>
mm	1.40	2.04	0.50	0.19	3.10	1.65	3.00	0.100	0.50
	0.95	1.78	0.35	0.08	2.70	1.20	2.20	0.013	0.20

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